Patent Claims

1. A gas turbine (1), in particular a stationary gas turbine for power generation,
having an injection apparatus (9) for injecting a liquid (W) into an air stream (L) that can be sucked in by a compressor (3), with the aid of which air stream a fuel (B) can be burnt in a downstream combustion chamber (5) to form a hot gas (H) which expands as it flows through the downstream turbine part (7), and
having a temperature-measuring device (M_{LU}) for recording the temperature of the air stream (L),
characterized
in that the temperature-measuring device (M_{TU}) is arranged upstream of the injection apparatus (9), and
in that the temperature (T_{V1}) of the air stream (L) at the inlet (12) of the compressor (3) is calculated by means of the measured temperature (T_u).

2. The gas turbine as claimed in claim 1, characterized in that the humidity of the air stream (L) can be determined upstream of the injection apparatus (9) by means of air-humidity-measuring devices (M_{FU}).

3. The gas turbine as claimed in claim 1 or 2, characterized in that the temperature (T_{V1}) is calculated by means of a function based on temperature and humidity distributions.

4. The gas turbine as claimed in claim 1, 2 or 3, characterized in that the temperature and humidity distributions can be predetermined in the form of diagrams.

5. A temperature-measuring device (M_{TU}) for recording the temperature of the air stream (L) upstream of the compressor (3) of a gas turbine (1), in particular a stationary gas turbine for power generation,
which has an injection apparatus (9) for injecting a liquid (W) into the air stream (L) that can be sucked in by the compressor (3),
with the aid of which air stream a fuel (B) can be burnt in a downstream combustion chamber (5) to form a hot gas (H) which expands as it flows through the downstream turbine part (7),
characterized
in that the temperature-measuring device (M_{TU}) is arranged upstream of the injection apparatus (9), and
in that the temperature (T_{V1}) of the air stream (L) at the inlet (12) of the compressor (3) is calculated by means of the measured temperature (T_u).

6. A control arrangement for controlling the hot-gas temperature of a hot gas (H) in a gas turbine (1), in particular a stationary gas turbine for power generation,
which has an injection apparatus (9) for injecting a liquid (W) into an air stream (L) that can be sucked in by a compressor (3),
with the aid of which air stream a fuel (B) is burnt in a downstream combustion chamber (5) to form the hot gas (H) which then expands as it flows through the downstream turbine part (7),
having a temperature-measuring device (M_{TU}) which records the temperature of the air stream (L) upstream of the compressor (3), the hot-gas temperature being controlled by the quantity of the fuel,
characterized
in that the temperature-measuring device (M_{TU}) is arranged upstream of the injection apparatus (9), and

in that the temperature (T_{v1}) of the air stream (L) at the inlet (12) of the compressor (3) is calculated by means of the measured temperature (T_u).

7. The control arrangement as claimed in claim 6, characterized in that the hot-gas temperature is recorded at the outlet (6) of the turbine part (7).

8. The control arrangement as claimed in one of claims 6 to 7, characterized in that the humidity (F_u) of the air stream (L) can be determined upstream of the injection apparatus (9) by means of air-humidity-measuring devices (M_{FU}).

9. The control arrangement as claimed in one of claims 6 to 8, characterized in that the temperature (T_{v1}) is determined at a minimum possible temperature ($T_{wetBulb}$) at which it is assumed there is sufficient evaporation for a 100% air humidity (F_U) to be present at the inlet (12) of the compressor (3).

10. The control arrangement as claimed in one of claims 6 to 8, characterized in that the temperature (T_{v1}) is calculated taking into account the evaporation of the injected liquid (W) in the air stream (L).

11. The control arrangement as claimed in one of claims 6 to 10, characterized in that the quantity of liquid (W) injected into the air stream (L) is altered as a function of the evaporation.

12. The control arrangement as claimed in one of claims 6 to 11, characterized in that the liquid is water, in particular distilled water.

13. The control arrangement as claimed in one of claims 6 to 12, characterized in that the temperature (T_{v1}) is calculated by means of a function on the basis of temperature and humidity distributions.

14. The control arrangement as claimed in one of claims 6 to 13, characterized in that the functions can be predetermined in the form of diagrams.